1. A truncated thrombomodulin protein derivative comprising EGF (4-6) like domains, a substitution of Leucine for methionine at position 388, and a GGM amino acid motif appended at a carboxy terminus of said derivative.

2. The truncated thrombomodulin protein of claim 1 wherein said GGM protein motif is expressed as a protein motif with a non-natural amino acid corresponding to the M amino acid residue.

3. SEQ ID NO:3.

4. A truncated thrombomodulin derivative conjugate comprising a truncated thrombomodulin derivative and a polymer; wherein the thrombomodulin derivative comprises EGF (4-6) like domains, a substitution of Leucine for methionine at position 388, and a GGM amino acid motif appended at a carboxy terminus of said derivative.

5. The conjugate of claim 4 wherein the polymer comprises polyethylene glycol.

6. A truncated thrombomodulin nucleic acid derivative comprising EGF (4-6) like domains, a substitution of Leucine for methionine at position 388, and a nucleic acid sequence capable of encoding a Gly Gly Met motif appended at a carboxy terminus of said derivative.

7. The thrombomodulin derivative of claim 5 comprising SEQ ID NO:1.

8. A method of generating a purified truncated thrombomodulin derivative protein, wherein the protein comprises EGF (4-6) like domains, a substitution of Leucine for methionine at position 388, and a non-natural amino acid; comprising the steps of providing a truncated thrombomodulin nucleic acid sequence; recombinantly expressing said nucleic acid sequence in the presence of a non-natural amino acid precursor; and purifying a recombinant expression product; thereby generating a purified truncated thrombomodulin derivative protein.

9. The method of claim 8 wherein said nucleic acid sequence is SEQ ID NO:1.

10. The method of claim 8 wherein the non-natural amino acid is selected from the group consisting of: methionine analogues, alanine analogues, phenylalanine analogues, leucine analogues, proline analogues and isoleucine analogues.

11. The method of claim 10 wherein said methionine analog is L-2-amino-4-azido-butanoic acid.

12. The method of claim 8 wherein the non-natural amino acid is located at a C-terminal portion of the construct.

13. A method of site-specific PEGylation of a bioactive protein, comprising identifying an amino acid residue capable of alteration wherein the alteration does not substantially impair a protein activity; altering said amino acid residue; integrating a non-natural amino acid residue into said bioactive protein at a site, and conjugating a PEG polymer to said non-natural amino acid at the site.

14. The method of claim 13 wherein the bioactive protein is thrombomodulin.

15. The method of claim 13 wherein the bioactive protein is a thrombomodulin derivative.

16. A conjugate of a thrombomodulin protein or a thrombomodulin derivative and a polymer.

17. The conjugate of claim 16 wherein the polymer is PEG.

18. The conjugate of claim 16 wherein the polymer can confer a property for the conjugate selected from the group consisting of: an increase in plasma half-life, stability against proteolytic cleavage, and a decrease of protein immunogenicity, or combination thereof.

19. The conjugate of claim 16 wherein the conjugate is soluble.

20. A thrombomodulin derivative comprising a catalytically active site capable of activating protein C and a non-natural amino acid.

21. The thrombomodulin derivative of claim 20 wherein the derivative comprises an extracellular portion of thrombomodulin.

22. The thrombomodulin derivative of claim 20 wherein said active site comprises EGF (4-6) domains.

23. The thrombomodulin derivative of claim 20 conjugated via said non-natural amino acid to a linear or branched natural or synthetic polymer.

24. The derivative of claim 23 wherein said linear or branched synthetic polymer is selected from the group consisting of poly(t-butyl acrylate), poly(t-butyl methacrylate), polyacrylamide, glycolipid and their mimetics; and other polymers; glycoproteins and their mimetics, poly(arginine), polysaccharides and their mimetics; and other polymers as would be understood in the art.

25. A method of conjugating a thrombomodulin derivative to a substrate selected from the group consisting of: a surface of a synthetic or a natural material; a targeting group for tissue-specific or site-specific delivery of the conjugate; and a compound capable of one or more additional anti-inflammatory/anti-thrombotic properties.

26. A thrombomodulin derivative, or conjugate thereof, capable of acting as a systemic agent for treatment of one or more conditions selected from the group consisting of: micro or macrovascular blood clots, stroke, heart attack, disseminated intravascular coagulation, and other inflammatory or prothrombotic condition.

27. A coating of a surface of a medically implanted or human tissue or fluid contacting device comprising a thrombomodulin derivative or conjugate thereof.

28. The coating of claim 27 wherein the implanted or human tissue or fluid contacting device is selected from the group consisting of a vascular graft,

stent, heart valve, dialysis membrane, membrane oxygenator, catheter, and guide wire.

29. A coating of a coating for living cells or tissue, comprising a thrombomodulin derivative or conjugate thereof.

30. The coating of claim 29 wherein said cells or tissue is selected from the group consisting of smooth muscle cells, fibroblasts, endothelial cells, stem cells, chondrocytes, osteoblasts, pancreatic islets, genetically engineered cells, and other cells.

31. The coating of claim 27 wherein said coating is capable of establishing or enhancing an anti-inflammatory property of said cells or tissue.

32. A covalent conjugate of a truncated TM derivative and a blood or tissue contacting surface, wherein said conjugate comprises a natural or synthetic polymers as a spacer.

33. A method for covalent conjugation of thrombomodulin to a synthetic or natural material site-specifically with substantial retention of protein bioactivity.

34. A recombinant thrombomodulin TM construct comprising EGF-like domains 4-6 and single or multiple non-natural amino acids optionally at a C-terminal portion of the construct.

35. The construct of claim 34 wherein the construct is modified through reaction with a suitable polymer spacer via one or more non-natural amino acids.

36. The modified construct of claim 35 wherein the modified construct is adapted for further immobilization onto a surface or for conjugation to linear or multifunctional natural or synthetic compounds that are capable of an anti-inflammatory or anti-thrombotic activity.

37. A method of generating a bioconjugate of a TM or TM derivative comprising a mild conjugation reaction so as to preserve TM bioactivity.

38. A thrombomodulin construct wherein the construct is conjugated to a natural or synthetic polymer; or other natural molecule such as an antibody or other ligand recognition molecule.

39. The construct of claim 38 wherein the ligand recognition molecule is antifibrin antibody.

40. The conjugated construct of claim 38 wherein a conjugated potion is connected via at least one non-natural amino acid in a recombinant TM protein.

41. A construct conjugated to a poly(ethylene glycol) molecule, wherein the PEG molecule is linear or branched.

42. The construct of claim 41 wherein the PEG is linear.

43. A thrombomodulin construct conjugated to a natural or synthetic polymer for surface anchoring.

44. The construct of claim 43 wherein the natural or synthetic polymer is multifunctional.

45. The construct of claim 43 wherein the polymer is poly(ethylene glycol).

46. The construct of claim 43 further comprising an anchoring group selected from the group consisting of: biotin, conjugated diene, azide, alkyne, diphenylphosphine, triarylphosphine; and other groups as would be understood in the art.

47. The construct of claim 43 further comprising a targeting group selected from the group consisting of: sialyl-Lewis X; an antibody, Fab fragment or the like; a protein or non-protein recognition molecule (including an aptamer) capable of recognizing VCAM-1, ICAM-1, or other inflammatory cell surface proteins; antifibrin antibody; streptavidin; azide; alkyne; N-(ε-maleimidocaproyl; and other targeting group as would be understood in the art.

48. A TM construct conjugated to a synthetic polymer for anchoring to a surface of a synthetic material or a natural material.

49. The construct of claim 48 wherein a synthetic material is selected from the group consisting of: poly(tetrafluoroethylene) , polysiloxanes, poly(ether urethane urea), poly(lactic acid-co-glycolic acid), a glass surface and derivatives; and other materials as would be understood in the art.

50. The construct of claim 48 wherein a natural material is selected from the group consisting of cells, tissues, and blood vessels.

51. A surface coating for a medically implanted or human tissue or fluid contacting device comprising a TM construct or conjugate thereof.

52. A surface coating for living cells or tissues comprising a TM construct or conjugate thereof.

53. A recombinant thrombomodulin construct conjugated to a multifunctional natural or synthetic polymer, wherein the polymer is capable of an anti-inflammatory or anti-thrombotic property.

54. The construct of claim 53, wherein the synthetic polymer comprises one or more anti-inflammatory groups or one or more additional anti-inflammatory groups.

55. The construct of claim 54, wherein said anti-inflammatory group comprises sialic acids; mimetics/derivatives thereof; and other groups as would be understood in the art.

56. A TM construct conjugated to a synthetic polymer further comprising an anti-coagulant or anti-thrombotic group.

57. The construct of claim 56 wherein the group comprises heparin; mimetics/derivatives thereof; and other groups as would be understood in the art.

58. A systemic agent for treatment of a medical condition, wherein the agent comprises a TM construct or conjugate thereof; wherein the condition relates to a microvascular or macrovascular blood clot, stroke, heart attack,

disseminated intravascular coagulation, or other inflammatory or prothrombotic condition.

59. A method of treatment of a medical condition by administering to a patient in need a TM construct of the invention or conjugate thereof.

60. The method of claim 59 wherein the condition relates to a microvascular or macrovascular blood clot, stroke, heart attack, disseminated intravascular coagulation, or other inflammatory or prothrombotic condition.